

Running head: IDENTIFYING INCENTIVES TO INSTALL SPRINKLERS

Leading Community Risk Reduction

Identifying incentives that may  
encourage Miramar citizens to  
install residential sprinkler systems.

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### CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

Signed: \_\_\_\_\_

### ABSTRACT

The problem was that single family homes in the City of Miramar were not protected by residential fire sprinklers, thus jeopardizing the life safety of the citizens residing in those structures. Three research questions were answered utilizing the descriptive research method. Two surveys and two interviews were conducted. The results showed that retrofit costs ranged from \$2 to \$3 per square foot, insurance discounts ranged from 3% to 13%, localized fire protection provided high benefit for low cost in retrofit situations, and grant funding could be pursued to assist the citizens who qualify for the fire assessment hardship exemption. Recommendations included pursuing a new construction ordinance, public education, advocating localized protection retrofits, temporary fire assessment fee exemption, and grant funding.

TABLE OF CONTENTS

Abstract ..... 3

Table of Contents ..... 4

Introduction..... 5

Background and Significance ..... 6

Literature Review..... 8

Procedures ..... 10

Results..... 14

Discussion ..... 21

Recommendations..... 25

Reference List ..... 27

Appendices

Appendix A: Sprinkler Contractor Survey ..... 29

Appendix C: Insurance Company Survey..... 31

*Identifying incentives that may encourage Miramar citizens to  
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## INTRODUCTION

No family would ever wish to experience the outcome of a fire in their home. The mere thought of losing a loved one, or having a family member severely burned is almost too much for one to contemplate. Even if a fire does not inflict these tragic consequences, the loss is still deep. Losing irreplaceable items such as photographs and being displaced from one's home for an extended period of time are just a couple of the burdens to be dealt with after a fire.

Many communities have come to rely on their local fire service for protection. The fire service is committed to saving lives and protecting property. Today's technologies and training allow the fire service to place highly trained personnel on scene faster than they have been able to do so in the past. Still, the tragedies occur.

On a daily basis, many lives and properties are lost as the result of fire. Even with the best response times, personnel, training, and equipment, the fire service cannot combat the rapid growth rate of fire. Fire sprinklers have proven to effectively extinguish or keep the fire in check until the fire service arrives; however, it is atypical to find a sprinkler system in a single family residence. Even though a vast amount of businesses in this country require protection by automatic sprinkler systems, communities requiring residential sprinkler protection are few and far between.

The problem is that single family homes in the City of Miramar are not protected by residential fire sprinklers, thus jeopardizing the life safety of the citizens residing in those structures.

Budgetary constraints affect the purchasing decisions of many American families. When presented with the cost of installing a residential fire sprinkler system, apathy usually supersedes fear. Many families would rather spend their money on something they can enjoy, rather than a proactively installing a residential sprinkler system. The purpose of this research is to identify financial incentives that would entice citizens to retrofit their home with a residential fire sprinkler system.

The research method utilized in this applied research project is descriptive research. This paper will focus on identifying the net cost to retrofit a home with a residential fire sprinkler system, and determining incentives which may further reduce the expense.

To carry out this study, three research questions will be answered. These three questions are:

1. What is the cost to retrofit a single family dwelling with a residential fire sprinkler system?
2. What discounts or incentives do insurance companies offer to entice their customers to install residential fire sprinklers?
3. What types of incentives have been identified to entice citizens to install residential fire sprinklers?

## BACKGROUND AND SIGNIFICANCE

The Miramar Fire Rescue Department is a comprehensive emergency services provider to the citizens and businesses of the City of Miramar, Florida. The City of Miramar is a rapidly growing 33 square mile community with a population exceeding 100,000. Miramar is located in Broward County, just southwest of Fort Lauderdale, bordering Miami-Dade County to its South, and the Florida Everglades to its West. The department's \$17.1 million budget enables us to

provide many services to our community, which can be categorized into fire suppression, emergency medical services (EMS), dive rescue, and fire prevention. Our system also places a strong emphasis on emergency management and disaster preparedness due to the frequency that hurricanes threaten the South Florida area, in addition to the national security initiative. Cross trained dual-role firefighter/paramedics compose 95% of our response personnel, with the remainder trained to the level of firefighter/emergency medical technician. These personnel, at different ranks, staff 4 fire stations which house 2 battalion officers, 3 advanced life support (ALS) fire engines, 1 ALS quint, 1 squad for air and light support, and 4 ALS rescue units, which are single-tier EMS transport units. A minimum of 2 of the response units are required to be staffed with 2 members of our specialized SCUBA dive rescue team. Additional specialized response teams for hazardous materials, technical rescue operations, air rescue, as well as any other additional standard resources are available through a mutual aid agreement with neighboring city and county departments. In addition to the fire inspectors and plans examiners within the Fire-Life Safety Division, the department also utilizes personnel trained as fire inspectors to perform fire inspections while assigned to response apparatus.

The City of Miramar is a fairly young municipality, celebrating its 50<sup>th</sup> birthday this year. The city's eastern area is comprised of primarily residential structures built in the 1950's and 1960's. The city's western area is comprised of residential and commercial structures built primarily within the past 10 years.

The City of Miramar's development has boomed in recent years. A community which only a few short years back had a population of less than 50,000 with limited multi-story and commercial occupancies has now more than doubled that population base and continues to grow. This growth has introduced many new residential developments. Had the city adopted a

residential sprinkler ordinance in the early 1990's, the majority of the city's residential structures would be protected by automatic sprinkler systems.

The Miramar Fire Rescue Department faces many challenges as a result of this rapid growth. The biggest impact has been to the department's response times. Steps have been taken to address the response time predicament; however, some of them are long term, such as the construction of a new fire station. If there were a delay in the fire department's notification or response, a residential fire sprinkler could help keep a fire in check until the arrival of initial units, potentially saving lives.

Although aspects of this applied research project can be linked any of the United States Fire Administration Operational Objectives, "2,500 communities will have a comprehensive multi-hazard risk reduction plan led by or including the local fire service" suitably relates to the subject matter. (USFA, 2004)

Responding to an issue that affects the potential life safety hazard of the community links this project directly to the content of the leading community risk reduction course.

## LITERATURE REVIEW

The literature review for this applied research project began at the Learning Resource Center, located on the campus of the National Emergency Training Center in Emmitsburg, Maryland. Additional research continued at the Southwest Regional Branch of the Broward County Library and at the Alvin Sherman Library, Research, and Information Technology Center located on the main campus of Nova Southeastern University. In addition, an extensive internet search was conducted to obtain information pertaining to the topic at hand. Information obtained from various authors pertaining to this subject is summarized within this section.

The Residential Fire Safety Institute (2003) compares the price of installing fire sprinklers in a new construction home to that of carpeting the structure, highlighting that carpeting will usually need to be replaced after 10 years, and sprinklers will not. “Prices can be expected to be under \$1.00 per square foot of habitable space to slightly over \$1.00. The lowest we have heard is 57 cents a square foot”. (§27)

In new construction, it is estimated that a fire sprinkler installation can run from 1 to 1.5% of the total construction cost of the home. (USFA, 2005)

Proposed changes to NFPA 13D could lower the minimum pressure rating, allowing contractors to utilize PEX-type piping. The perception is that this type of piping could reduce installation costs and make it easier to retrofit a residence. (Higgins, 2005)

“Insurance from homeowner underwriters will vary depending on type of coverage. The discounts now range between 5-15%, with a projected increase in available discounts.” (USFA, 2004, §19)

In a California study, 6 insurance companies quoted discounts between \$90 and \$165 a year. (USFA, 2005)

Wolk (2001) recommends that the City of Camas, Washington should eliminate fire impact fees, eliminate permit fees, eliminate plan review fees, reduce fees for larger water meters, and allow longer access roads to entice residents to install sprinkler systems in their homes.

Frain (2001) emphasizes education to convey the benefits of installing residential fire sprinklers. His recommendations include educating the public utilizing different forms of media along with local fire department based types of education. He goes on to discuss the difficulty of

educating the building community, suggesting that obtaining the support of a builder trade group and producing seminars may be an approach to investigate.

Britt proposed enacting an ordinance which would include “construction provisions for incentives to developers and builders in terms of construction trade-offs for sprinklered structures and design alternatives for entire sprinkler protected developments.” (1996, p 61) He felt that it was important to consent to voluntary compliance with this ordinance in order to increase its chances of successful implementation.

A main strategy of the National Fire Sprinkler Initiative is to “advocate localized fire suppression in high fire risk areas (e.g., kitchens) for retrofit applications.” (Milke, 2003)

Recently, a fatal school bus crash occurred in Arlington, VA. This incident re-emerged the controversial discussion of enacting a federal mandate requiring seatbelt installations in all school buses. (Anderson and Cho, 2005)

“Rather than requiring seat belts, NHTSA decided that the best way to provide crash protection to passengers is through a concept called ‘compartmentalization.’” (NHTSA, 2005, ¶6)

The findings of the authors referenced in the literature review inclined the author of this project to convey the difficulty we as fire service professionals face in convincing homeowners to invest their time and money into a safety system proactively, given that a fire may or may not occur in their home.

## PROCEDURES

For the purpose of determining costs and incentives associated with a Miramar citizen retrofitting his or her home with a residential fire sprinkler system, research procedures followed in this project included:

- Surveying local fire sprinkler contractors on the topics of feasibility and cost associated with retrofitting a single family residence with fire sprinklers.
- Surveying property insurance companies to determine what types of discounts are being offered to those homeowners who choose to install a residential sprinkler system.
- An interview with the Miramar Fire Rescue Department's Fire Marshall.
- An interview with the Miramar Fire Rescue Department's Emergency Management Coordinator / Grant Writer.

The survey and interview questions were distributed to a test crowd of 6 firefighters and officers. This group was instructed to proofread the questions, and provide feedback. All 6 advised that the questions were legitimate and easy to understand.

#### *Surveys.*

Two telephone surveys were conducted. The first was to determine the feasibility of and costs associated with retrofitting a single family residence with fire sprinklers. The second was to identify the types and amount of property insurance discounts available. The author contacted 23 fire sprinkler contractors in the South Florida area, and 7 property insurance companies. In each instance, the author read verbatim from a prepared statement. (Appendices A and B).

The resources available on the Home Fire Sprinkler Coalition's website yielded only two residential sprinkler contractors in the South Florida Area. The remainder of the sprinkler contractor names and phone numbers were obtained utilizing the Bellsouth Realpages.com phone directory. The author utilized the website to find business which matched the category of "SPRINKLERS-AUTOMATIC-FIRE" in Miramar, Florida.

The names and phone numbers of the property insurance companies were obtained utilizing the Google internet search engine. The author utilized the search engine website to locate contact information for the companies by searching for “Property Insurance”.

The author chose to utilize the telephone as the survey process in order to speak directly to the person within each company who could best answer his questions. By contacting these companies during normal business hours, the author was able to communicate directly with a knowledgeable representative. The author felt utilizing the mail as the survey process would present a minimal response.

#### *Personal Interviews.*

The author conducted two personal interviews. Each person interviewed was carefully chosen because of his knowledge and expertise pertaining to the topic at hand.

The first interview was with the Miramar Fire Rescue Department’s Fire Marshall, Maurice Majszak. The author chose to interview this individual due to his vast knowledge of fire prevention theory and application. Fire Marshall Majszak is important to this project due to his experience within the City of Miramar, in conjunction with his comprehension of the Florida Fire Prevention Code and its application. The interview was conducted in the Fire Marshall’s office.

The questions asked during the interview were:

1. Are you aware of the National Residential Sprinkler Initiative?
2. Do you believe the City of Miramar should embrace an ordinance requiring newly constructed homes to be protected by an automatic fire sprinkler system?
3. Do you feel there would be a way to entice citizens to retrofit an existing residence with a fire sprinkler system?

4. Do you believe that the city would embrace a program to make a retrofit cost neutral over time, such as bypassing the fire assessment fee for a number of years?
5. Are there any other incentives you would suggest?
6. How would you summarize an action plan to implement a plan like this within the city?

The second person interviewed was the Miramar Fire Rescue Department's Emergency Management Coordinator / Grant Writer, Romeo Lavarias. The author chose to interview this individual due to his experience in obtaining information pertaining to grant availability and application. Mr. Lavarias is important to this project because of his position within the city, and for his knowledge of the feasibility in obtaining grant funding to assist in the implementation of a venture such as this one. The interview was conducted in the conference room at the Miramar Fire Rescue administrative headquarters.

The questions asked during the interview were:

1. Are you aware of the National Residential Sprinkler Initiative?
2. How do you feel about a project enticing citizens to retrofit an existing residence with a fire sprinkler system?
3. Do you believe the city could obtain grant funding to implement a project such as the single sprinkler head concept for those residents who qualify for this hardship exemption?
4. If the city was approved to receive a matching grant, do you believe that the matching funds would be approved?
5. Are there any other suggestions you might offer?

*Limitations.*

The fire sprinkler contractors contacted could not provide an accurate estimate without visiting or viewing plans of an actual residence. For the purpose of this project, the author utilized a general estimate of cost per square foot to install a residential sprinkler system provided by each contractor. Actual costs vary slightly depending on the design and accessibility of the structure at hand. In addition, the estimates provided did not taken into consideration the cost of repairing any ceilings or other structural components damaged during the installation process.

## RESULTS

Research question #1: What is the cost to retrofit a single family dwelling with a residential fire sprinkler system?

The author contacted 23 fire sprinkler contractors in the Miramar area. Of those contacted, 17 participated in the survey. The results of the survey of residential sprinkler contractors are as followed:

1. Does your company install residential fire sprinkler systems?

Yes 15 / No 2

Approximately 88% of the participating fire sprinkler contractors would install a residential system. The survey terminated at this point for those who would not install a residential fire sprinkler system.

2. Will your company retrofit an existing house with a residential fire sprinkler system?

Yes 15 / No 0

100% of the contractors asked this question would retrofit an existing house with a residential fire sprinkler system.

3. Can you provide an approximate cost per square foot to retrofit an existing home with residential fire sprinklers?

Yes 10 / No 5

Approximately 66% of the contractors could provide an estimate for the survey's purpose.

4. What is the approximate cost per square foot to retrofit an existing home with residential fire sprinklers?

As stated in the procedural limitations, this question was difficult for the contractors surveyed to answer without actually visiting the residence, or at least viewing the structural plans. Of the 10 who were able to provide an approximate cost, 5 advised the author that it would be safe to estimate sprinkler installation cost at \$2 per square foot. This same cost was also derived from an additional 2 contractors who gave a price of \$200 per sprinkler head, which covers a 100 square foot area. Of the remaining 3 contractors, 2 estimated costs at \$3 per square foot, and the last at \$2.75 per square foot.

5. What additional costs should the homeowner anticipate?

Nearly all contractors had a similar response for this question. Homeowners should anticipate spending additional funds on repairing any ceiling or drywall damaged during the installation process. In addition, homeowners should anticipate permitting fees and possible fees relating to changes in municipal water service delivery, such as a larger water meter.

The purpose of the survey was to determine a general cost which a Miramar resident could anticipate to spend if he or she chooses to install a fire sprinkler system.

Research question #2: What discounts or incentives do insurance companies offer to entice their customers to install residential fire sprinklers?

The author contacted 7 property insurance companies. Of those contacted, all 7 participated in the survey. The results of the survey of property insurance companies are as followed:

1. Does your company provide property insurance coverage in the State of Florida?

Yes 5 / No 2

The survey terminated at this point for those who provide property insurance coverage in the State of Florida.

2. Does your company offer discounts to homeowners who have a residential fire sprinkler system?

Yes 3 / No 2

The survey terminated at this point for those companies that do not offer a discount for homeowners who install a residential fire sprinkler system.

3. If your company does offer a discount, is it a flat rate, or a percentage of the premium?

Flat Rate 0 / Percentage of Premium 3

4. If your company does offer a discount, is there a single type, or multiple types?

Single 1 / Multiple 2

5. Please explain the type and amount of each discount offered by your company?

The company offering a single type of discount provides its customers with a 3% discount if the residence is protected with an automatic fire sprinkler system.

The 2 companies offering multiple discounts have identical programs in place.

Residential structures having fire sprinkler protection in the closets and attic spaces are afforded

an 8% discount. Those residential structures with complete protection, inclusive of the closets, attics, and living space, are afforded a 13% discount.

The purpose of the survey was to determine an anticipated insurance cost saving which a Miramar resident could factor into the decision process of whether or not to install a fire sprinkler system.

Research question #3: What types of incentives have been identified to entice citizens to install residential fire sprinklers?

The author conducted 2 personal interviews. The responses from the 2 professionals interviewed are detailed below.

In an interview with the Miramar Fire Rescue Department's Fire Marshall, Maurice Majszak, a valuable amount of information was obtained.

1. Are you aware of the National Residential Sprinkler Initiative?

"Yes."

2. Do you believe the City of Miramar should embrace an ordinance requiring newly constructed homes to be protected by an automatic fire sprinkler system?

I do, but I don't think that an ordinance is the right way to go. We are a charter county, and the city ordinance can be challenged. The definitive answer would be a change to the county land development code. Builders must comply with this code; however, it would be much more difficult to make a change at the county level, rather than the city level.

At this point, the author shared the results of the sprinkler contractor and insurance company surveys with Mr. Majszak.

3. Do you feel there would be a way to entice citizens to retrofit an existing residence with a fire sprinkler system?

The cost of retrofitting ones home with an NFPA 13D compliant system would not be embraced by many residents. In addition, NFPA 13D does not require sprinklers to be installed in closets and attic spaces, which is the basis for the discounts offered by the insurance companies.

4. Do you believe that the city would embrace a program to make a retrofit cost neutral over time, such as bypassing the fire assessment fee for a number of years?

I believe this is a possibility. We already have a program in place which allows residents who meet specific criteria to be exempt from this fee. The city may also be receptive to waiving certain permitting and inspection fees. The city should ensure that the discount is not afforded to those who are required to install a sprinkler system by law, such as an assisted living facility (ALF).

5. Are there any other incentives you would suggest?

Many residential fires begin in the kitchen. A single sprinkler head located in the kitchen could help in this instance. It is not the total coverage afforded by an NFPA 13D system; however, it is better than no protection. This cost is much easier to justify. Up to 6 sprinkler heads can be run off of a domestic water system, and can be installed by a plumbing contractor, rather than a licensed sprinkler contractor. A single head, installed in the cooking area by a plumbing contractor, run off the domestic water supply, would provide a lot of protection for little money.

6. How would you summarize an action plan to implement a plan like this within the city?

I would begin with a public education campaign on the value of installing a single sprinkler head in the kitchen. A major part of this would be to obtain the statistics and

cost incurred by the damage done by a kitchen fire. I would also work with the insurance companies to have them determine a discount for those homeowners who install single head, and attempt make it consistent between the insurance providers. In addition, I would pursue fee waivers and fire assessment fee rebates in order to make the installation cost neutral.

The purpose of the interview was to determine what types of fire sprinkler system incentives should be offered to a Miramar resident a from a life safety perspective.

In an interview with the Miramar Fire Rescue Department's Emergency Management Coordinator / Grant Writer, Romeo Lavarias, additional information beneficial to this project was obtained.

1. Are you aware of the National Residential Sprinkler Initiative?

"No."

At this point, the author summarized the National Residential Sprinkler Initiative along with the results of the sprinkler contractor and insurance company surveys and the interview performed with Mr. Majszak.

2. How do you feel about a project enticing citizens to retrofit an existing residence with a fire sprinkler system?

"I think it is a great idea. I know the USFA has objectives to reduce the loss of life in elderly and young children, and I truly believe this would help that cause."

It was explained to Mr. Lavarias that one of the incentives identified is to offer an exemption to the fire assessment fee. For those residents who already receive a hardship exemption, this would provide little incentive.

3. Do you believe we could obtain grant funding to implement a project such as the single sprinkler head concept for those residents who qualify for this hardship exemption?

During this phase of the interview, Mr. Lavarias explained the grant application, review, and approval procedure to the author. In addition, he explained the aspects of a matching grant, where the municipality awarded would have to come up with a percentage of the project in order to receive the grant funding. Although the process would take some time, Mr. Lavarias believes it may be possible for the City of Miramar to obtain grant funding to implement a project such as this one.

“Many of those who qualify for the hardship exemption are part of our elderly population, which are a main component of the USFA objectives.”

4. If the city was approved to receive a matching grant, do you believe that the matching funds would be approved?

“I don’t see why not. It is defiantly a project that would benefit the community, and the city has always approved the matching funding for the firefighter safety grants we obtained in the past.”

5. Are there any other suggestions you might offer?

“If this project does come to fruition, I would suggest that you work with the social services director in order to determine which citizens would benefit the most from such grant funding.”

The purpose of the interview was to determine grant funding is possible to assist in the installation of a fire sprinkler system for those Miramar residents who could not afford to do so, even with incentives in place.

The results of the project show that the Miramar Fire Rescue Department must embrace creative ideas to convince its citizens to invest in a residential fire sprinkler system.

## DISCUSSION

For the most part, a residential fire sprinkler system is a foreign concept in the South Florida community. The only receptiveness to this concept, both in and out of the fire service, was from those who have spent their career in prevention.

When performing the survey of local sprinkler contractors, almost every receptionist hesitated when asked if the author could speak with someone about a residential sprinkler system. One receptionist actually asked “Are you a firefighter?” The receptionist then stated that the company has only installed one such system, and it was in a firefighter’s home.

While reviewing available literature to determine the cost of installing a residential sprinkler system, information pertaining to retrofit cost was practically non-existent. The author simply found information pertaining to the cost of a new construction installation, with the inference that the cost to install a system in an existing residence would be slightly more.

In new construction, it is estimated that a fire sprinkler installation can run from 1 to 1.5% of the total construction cost of the home. (USFA, 2005) “Prices can be expected to be under \$1.00 per square foot of habitable space to slightly over \$1.00. The lowest we have heard is 57 cents a square foot”. (RFSI, ¶27) In areas such as Scottsdale, AZ where sprinklers have been mandated in new construction for years, higher volume drives down costs. Also, when speaking of a cost as low as 57 cents per square foot, it is probably based on the cost a developer paid for an entire community. True costs may be offset by the savings obtained through construction trade-offs.

It is much easier for an installation crew to work during the construction phase. The walls and ceilings are open; there is no furniture, and no homeowners are under foot. When retrofitting a residence, it is more difficult and time consuming to perform the job, thereby increasing labor costs.

Higgins (2005) describes how anticipated changes in the NFPA 13D maximum pressure rating requirements could set the path for the utilization of PEX-type piping. He goes on to convey that contractors believe this may make it easier to perform a retrofit installation.

Those fire sprinkler contractors who participated in the survey quoted prices for a retrofit installation. Taking into consideration the limitations described earlier, the majority of those surveyed estimated a retrofit cost of \$2 per square foot, with others quoting upward to \$3 per square foot. Another variable which could increase the cost would be that the residential layout may necessitate more than 1 sprinkler head per 100 square feet in some areas. In this instance, the logic behind the per square foot pricing is based on a cost of \$200 per sprinkler head, which covers 100 square feet. If 5 additional heads are necessary due to the residential layout, the project cost would increase \$1,000.

For discussion purposes, let's consider the cost to retrofit a 2,000 square foot home. At the low end quote of \$2 per square foot, we could estimate the installation cost at \$4,000. Let us also take into consideration the residential layout example above and add \$1,000 to the cost, bringing the total to \$5,000 at this point.

The answers to the last question on the survey conveyed that homeowners should anticipate spending additional funds on repairing any ceiling or drywall damaged during the installation process. In addition, homeowners should anticipate permitting fees and possible fees

relating to changes in municipal water service delivery, such as a larger water meter. Again, for discussion purposes, we are going to provide a general estimation of \$1,000 to cover these costs.

Utilizing this example, the low end cost to retrofit a 2,000 square foot residence in the Miramar area could run about \$6,000.

The Residential Fire Safety Institute (2003) compares the price of installing fire sprinklers in a new construction home to that of carpeting the structure. When speaking of a retrofit installation, we may be approaching the cost of replacing the roof.

It has been conveyed that insurance discounts could help offset the cost of installing a residential sprinkler system. The USFA (2004) depicts discounts between 5 and 15%, with an optimistic look at higher discounts in the future. Another study offers a hard dollar estimate between \$90 and \$165 a year. (NRFSI, 2005) The results of the insurance company survey convey a slightly lower discount range of 3 to 13%.

Let's come up with an example of insurance discounts to work with the estimate above. Say that property insurance costs \$1 per square foot per year. Our 2,000 square foot home would cost us \$2,000 per year to insure.

Utilizing the high figure obtained of a 13% discount; this would afford us a \$260 per year reduction in our insurance premium. Considering our \$6,000 expenditure, it could take us over 23 years to recoup that cost through insurance premium discounts. If a homeowner plans to stay in a house for 5 to 10 years, can we convince that homeowner to embark on a project of this magnitude based on the promise of a property insurance discount?

Britt proposed enacting an ordinance which would include "construction provisions for incentives to developers and builders in terms of construction trade-offs for sprinklered structures and design alternatives for entire sprinkler protected developments." (1996, p 61)

Although this is an excellent idea for new construction, it would have no impact on the cost to retrofit an existing home.

Wolk's (2001) recommendations to eliminate fire impact fees, eliminate permit fees, eliminate plan review fees, and reduce fees for larger water meters could apply to both new and existing construction. Embracing these concepts, let us factor additional savings into our virtual sprinkler retrofit.

Rather than attempting to sort out how much of the estimated \$1,000 of additional costs would be for fees and how much would be for drywall repair, let's allocate it entirely toward fees and remove that amount. This brings our figure down to \$5,000. The current fire assessment fee in the City of Miramar is \$112 per year. Adding this number to the \$260 in insurance premium savings affords us a total annual savings of \$372. Even when factoring in all identified incentives, it would still take the homeowner over 13 years to recoup their initial \$5,000 expenditure.

For the safety conscious long term resident, these incentives may be enough to provoke a decision to move forward with the project. At this point we must ask where the funding will come from. Not many American families have an extra \$5,000 available to immediately allocate toward a project like this. If a home equity loan is obtained, will the interest costs overshadow the incentive savings?

We must start somewhere, and selling the idea of installing a fire sprinkler system in new construction is definitely a positive impact; but how do we address the life safety problem in the millions of existing homes across America?

This sprinkler debate has been going on for decades. In comparison, a fatal school bus crash recently occurred in Arlington, VA. This incident re-emerged the controversial discussion

of enacting a federal mandate requiring seatbelt installations in all school buses. (Anderson and Cho, 2005)

Similar to those who have championed the residential fire sprinkler initiative, advocates for school bus seatbelts have not been able to invoke a definitive adoption of a seatbelt mandate. “Rather than requiring seat belts, NHTSA decided that the best way to provide crash protection to passengers is through a concept called ‘compartmentalization.’” (NHTSA, 2005, ¶6)

This type of compromise is also being embraced by those spearheading the sprinkler initiative. As identified in the interview with Fire Marshall Majszak, a single sprinkler head in the kitchen has a high benefit with a low cost. A main strategy of the National Fire Sprinkler Initiative is to “advocate localized fire suppression in high fire risk areas (e.g., kitchens) for retrofit applications.” (Milke, 2003)

Using the cost estimate of \$200 per head identified by the sprinkler contractor survey, localized fire suppression could feasibly be installed as a retrofit option in many residences. Even without the insurance discount, if the city offered a temporary exemption to the fire assessment fee to make the installation cost neutral, the homeowner could recoup costs within a couple of years.

Frain (2001) emphasizes education to convey the benefits of installing residential fire sprinklers. His recommendations include educating the public utilizing different forms of media along with local fire department based types of education. In order to obtain acceptance of this idea, the public would have to be educated on the cost/benefit of embracing this concept.

## RECOMMENDATIONS

The Miramar Fire Rescue Department should:

- Advocate the adoption of a new construction residential sprinkler ordinance by the City of Miramar.
- Advocate the adoption of a new construction residential sprinkler requirement into the Broward County land development code.
- Develop and launch a public education campaign on the benefits of residential fire sprinklers.
- Advocate the concept of localized fire protection for retrofit applications.
- Advocate temporary exemption from the fire assessment fee until the sprinkler installation/retrofit is cost neutral.
- Pursue grant funding for localized fire protection in the homes of those who already qualify for a hardship exemption to the fire assessment fee.

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## APPENDIX A

## Sprinkler Contractor Survey

I am conducting a survey as part of an applied research project for the Executive Fire Officer Program at the National Fire Academy. I would like to ask you a few short questions pertaining to residential fire sprinkler systems. Your responses will be confidential, and only the results of the survey will be published. May I trouble you for a couple of moments of your time?

1. Does your company install residential fire sprinkler systems?

Yes / No

2. Will your company retrofit an existing house with a residential fire sprinkler system?

Yes / No

3. Can you provide an approximate cost per square foot to retrofit an existing home with residential fire sprinklers?

Yes / No

4. What is the approximate cost per square foot to retrofit an existing home with residential fire sprinklers?

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5. What additional costs should the homeowner anticipate?

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Thank you for your time. Would you like to receive a copy of the survey results upon completion? Yes / No

If yes, preferred method: Mail / E-mail

Contact information: \_\_\_\_\_

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## APPENDIX B

## Insurance Company Survey

I am conducting a survey as part of an applied research project for the Executive Fire Officer Program at the National Fire Academy. I would like to ask you a few short questions pertaining to residential fire sprinkler systems. Your responses will be confidential, and only the results of the survey will be published. May I trouble you for a couple of moments of your time?

1. Does your company provide property insurance coverage in the State of Florida?

Yes / No

2. Does your company offer discounts to homeowners who have a residential fire sprinkler system?

Yes / No

3. If your company does offer a discount, is it a flat rate, or a percentage of the premium?

Flat Rate / Percentage of Premium

4. If your company does offer a discount, is there a single type, or multiple types?

Single / Multiple

5. Please explain the type and amount of each discount offered by your company?

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Thank you for your time. Would you like to receive a copy of the survey results upon completion? Yes / No

If yes, preferred method: Mail / E-mail

Contact information: \_\_\_\_\_

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